

REMARKS/ARGUMENTS

Favorable consideration of this application, as presently amended, is respectfully requested.

Claims 1-10 were previously canceled without prejudice or disclaimer. Claims 11, 12, 17, and 18-24 have been amended to better clarify the invention and to better conform to U.S. claim practice. The changes made are deemed to be self-evident from the original claims and the disclosure at page 8, lines 9-17, page 8, line 36 to page 9, line 1, page 9, lines 6-10, and page 9, line 37 to page 10, line 5, for example. Thus, the claim changes are not deemed to raise any issues of new matter.

The outstanding Office Action presents objections to Claim 18 and Claim 24, a rejection of Claims 11-13 and 15-17 under 35 U.S.C. §103(a) as being unpatentable over Walker et al. (U.S. Published Patent Application No. 2002/0024628, Walker) in view of Huang et al.al. (U.S. Published Patent Application No. 2002/0071085, Huang) in further view of Ohno (U.S. Patent No. 4,600,273), a rejection of Claim 14 under 35 U.S.C. §103(a) as being unpatentable over Walker in view of Huang and Ohno in further view of Chang et al. (EP 827190 A2, Chang), a rejection of Claims 18-21, 23, and 24 over Huang in view of Ohno, and a rejection of Claim 22 under 35 U.S.C. §103(a) as being unpatentable over Huang in view of Ohno in further view of Chang.

The present amendment to Claims 18 and 24 clarifies that the second substrate has a contour closely adjacent to that of the sealing frame instead of the objected to language “cutout.” Accordingly, withdrawal of this objection to Claims 18 and 24 is respectfully requested.

Before considering the rejections under 35 U.S.C. §103(a), it is believed that a brief revue of the present invention would be helpful.

In this regard, a first aspect of the present invention relates to a method of fabricating liquid crystal cells on a silicon substrate, in which a back electrode substrate and an active matrix circuit silicon substrate are assembled with a sealing frame and disposed so as to have a part that overlap external contact pads provided closely adjacent to the active matrix circuit silicon substrate and a portion of an external connection arrangement provided on the back electrode substrate. At least the part of the sealing frame located between the contact pads and the portion of the external connection arrangement contains conductive elements to connect the portion of the external connection arrangement to the contact pads. The external connection arrangement and the part of the back electrode substrate mounting it project outwardly to overhang the active matrix substrate, which allows room for making a connection from the external connection arrangement to an external device that is coupled to the active matrix circuit on the silicon substrate without consuming space on the semiconductor substrate usually used for such an external connection. Thus, there is more efficient use of the silicon wafer from which the silicon substrates are cut in terms of being able to form more active matrix containing substrates that can be cut from the same wafer.

A second aspect of the invention relates to liquid crystal cells fabricated using the above-noted improved method with the above noted resulting structure.

Turning to the outstanding rejection of Claims 11-13 and 15-17 under 35 U.S.C. § 103(a) as being unpatentable over Walker in view of Huang and in further view of Ohno, it is noted that the outstanding Action admits that the primary reference to Walker fails to teach the claimed forming of means for external connection on the first substrate (having the claimed back electrode) as previously and presently claimed, as well as the Claim 11 required “cutting the transparent support so that a zone of each first substrate comprising the means for external connection is overhanging with respect to the second substrate to which it is assembled.” The outstanding Action also acknowledges the lack of any teaching or

suggestion in Walker of the Claim 11 required overlapping of the contact pads and an opposite portion of connection means on the first substrate with the recited sealing frame.

Not only does Walker not teach or suggest these limitations of Claim 11, it actually teaches the exact opposite as pads 405 on the outcrop portion of the semiconductor substrate shown in FIG. 36 are taught to be used themselves to make external connections. See paragraph [0120] of Walker teaching that land pads 405 are provided on the semiconductor substrate projecting portion to “permit electrical communication between the circuitry within micro liquid crystal display 400 and devices external to micro liquid crystal display 400 such as a device driver on a driver board.” This teaching means that the land pads cannot be considered to be “in close proximity to . . . the active matrix circuit” they connect to as this would be contrary to the desired operation of Walker requiring spacing so that the land pads can be coupled to “devices external to micro liquid crystal display 400 such as a device driver on a driver board.” Thus, a complete redesign and change in operating principle would be required to provide the external connections of Walker on an overhanging part of the first substrate instead of an overhanging part of the second substrate as actually taught and illustrated. Such substantial redesign and changed operating principle points directly away from a reasonable finding of obviousness. *See In re Ratti*, 270 F.2d 810, 813, 123 USPQ 349, 352 (CCPA 1959) (“suggested combination of references would [improperly] require a substantial reconstruction and redesign of the elements shown in [the primary reference]”).

Moreover, as the sealing frame 150 with non conductive spacers 152 of Walker is taught and illustrated to be well removed from at least one side of the semiconductor substrate to provide the above-noted overhanging part of the semiconductor substrate (see, e.g., FIG. 36) and still another side of the sealing frame 150 must be well removed from the cross-over material 170 (that provides voltage from wafer 115 to conductor 130 of substrate 100, see paragraph [0072]) side of the semiconductor substrate (note the spacing provided in

both FIGS. 35 and 36 for 170), there is nothing in Walker to teach or reasonably suggest this independent Claim 11 limitation. It is well established that a *prima facie* case of obviousness requires that all claim limitations be considered and demonstrated to be taught or suggested by the prior art, see MPEP §2143.03.

The outstanding Action suggests that the artisan would undertake the above-noted complete redesigns of Walker to provide for forming means for external connection on the first substrates as taught by Huang (as to lines 94 that are formed opposite metal lines 86 on the semiconductor substrate that are called contact pads in the outstanding Action) and to have the glass substrate with these lines 94 overhang the semiconductor substrate to allow “an adhesive for bonding the liquid crystal panel and the printed circuit board to be cured by UV light transmitted through the transparent substrate ([0043], lines 3-6),” as noted at page 4 of the outstanding Action.

First, lines 3-6 of paragraph [0043] of Huang simply teach curing the adhesive bonding the panel to the printed circuit board, not curing this board. Second, while the material of sealing frame 150 of Walker is disclosed as preferably being a “heat-cured adhesive” in paragraph [0068], ultraviolet-cured adhesives are also mentioned here.

The artisan would certainly understand that the use of UV adhesives requires an exposure to UV radiation and that this can only be effective if done through the transparent glass substrate to cure the adhesive. As the transparent substrate exists, this exposure is not in any way dependent on adding a transparent substrate overhang or mounting of lines 94 on this overhang to be opposite to metal lines 86 on the semiconductor substrate. Therefore, there has been no reasoning with some “rational underpinning” offered in support of the proposed modification of Walker to incorporate such changes taught by Huang. See *In re Kahn*, 441 F.3d 977, 988, 78 USPQ 2d 1329, (Fed. Cir. 2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some

articulated reasoning with some rational underpinning to support the legal conclusion of obviousness").

Moreover, to whatever extent that Huang teaches mounting lines 94 on an overhanging part of the transparent substrate, there is no teaching of any reason for "cutting the second substrate from the silicon wafer along cutting lines closely adjacent to corresponding sides of the sealing frame to conserve surface area on the silicon wafer to increase the number of second substrates obtained from the silicon wafer" as recited by Claim 11. Clearly, the sides of sealing frame 92 (called the frame seal in paragraphs [0048]-[0049], for example) are illustrated to be well removed from the cut edges (that must correspond to the cutting lines) of semiconductor substrate 82 in both FIGS. 8 and 9 of Huang.

To whatever extent that Ohno teaches two transparent glass substrates 100a and 100b that each have electrodes on facing and partially overlapping surfaces that are joined by a resin 103 containing conductive particles 101, no cutting of either glass substrate is taught to be done relative to the binding resin and conductive particles being in place as a sealing frame. Instead, the resin with particles are coated on the electrode 104 and then the already cut substrates 100a and 100b are brought together to be bonded by the hardening of resin 103 as described at col. 10, lines 5-14, for example. Thus, the bonding of two glass substrate teachings of Ohno do not cure the deficiencies of Walker and/or Huang even if there was some articulated reasoning with some rational underpinning offered in support of the proposed modification, which is also not the case as to the suggestion of adopting teachings from Ohno.

In this last regard, the advantages offered at col. 8, lines 25-32 and lines 33-37 of Ohno relied on at page 5 of the outstanding Action relate to EXAMPLE 12 and "foregoing embodiments 1-6," not the later described and relied on embodiment shown in FIG. 7 and described as EXAMPLE 13. Moreover, the advantages noted are clearly relative to the

conventional display panels illustrated in FIGS. 1, 2, and 4 that have nothing to do with the panels taught by Huang or Walker.

Accordingly, it is respectfully submitted that base independent Claim 11 clearly patentably defines over the teachings and fair suggestions found in any of Walker, Huang, and/or Ohno considered alone or together in any proper combination. Therefore, withdrawal of the rejection of Claim 11 under 35 U.S.C. §103(a) as being unpatentable over Walker in view of Huang and Ohno is respectfully requested for all the reasons set forth above.

In addition the withdrawal of the rejection of Claims 12, 13, and 15-17 under 35 U.S.C. §103(a) as being unpatentable over Walker in view of Huang and Ohno is respectfully requested as these claims all depend from Claim 11 and, thus, incorporate all the limitations of Claim 11 that are noted above to patentably defines over the teachings and fair suggestions found in any of Walker, Huang, and/or Ohno considered alone or together in any proper combination. Therefore, withdrawal of the rejection of Claims 12, 13, and 15-17 under 35 U.S.C. §103(a) as being unpatentable over Walker in view of Huang and Ohno is also respectfully requested.

In addition, each of Claims 12, 13, and 15-17 add features to those of independent base Claim 11 that are further not taught or reasonably suggested by any of Walker, Huang, and/or Ohno considered alone or together in any proper combination. Therefore, withdrawal of the rejection of Claims 12, 13, and 15-17 under 35 U.S.C. §103(a) as being unpatentable over Walker in view of Huang and Ohno is respectfully requested for this reason as well.

With regard to the rejection of Claim 14 under 35 U.S.C. §103(a) as being unpatentable over Walker in view of Huang and Ohno in further view of Chang, it is noted that Claim 14 depends from Claim 11 and thus incorporates all its limitations while Chang cures none of the above-noted deficiencies of Walker, Huang, and/or Ohno considered alone or together in any proper combination. Therefore, withdrawal of the rejection of Claim 14

under 35 U.S.C. §103(a) as being unpatentable over Walker in view of Huang and Ohno in further view of Chang is respectfully requested. In addition, Claim 14 adds features to those of independent base Claim 11 that are further not taught or reasonably suggested by any of Walker, Huang, Ohno and/or Chang considered alone or together in any proper combination. Therefore, withdrawal of the rejection of Claims 12, 13, and 15-17 under 35 U.S.C. §103(a) as being unpatentable over Walker in view of Huang, Ohno, and Chang is respectfully requested for this reason as well.

Turning to the rejection of Claims 18-21, 23, and 24 over Huang in view of Ohno, it is noted that independent Claims 18 and 24 require that the contact pads on the second silicon substrate to be “in close proximity to and connected with the active matrix circuit” and that “the silicon substrate includes exterior sides that are all closely adjacent to corresponding exterior sides of the sealing frame.” These limitations insure that there is no part of the second silicon substrate that extends any significant distance from the contour of the sealing frame.

Neither Huang nor Ohno teach or suggest any restriction on the relatively long lead lengths provided on each of their illustrated substrates (none of which are silicon in the device taught by Ohno), much less any teaching or suggestion that “the silicon substrate includes exterior sides that are all closely adjacent to corresponding exterior sides of the sealing frame.”

As noted above, the rationale for combining these references is not one built on a solid foundation in terms of having any “rational underpinnings.”

Accordingly, it is respectfully submitted that independent Claim 18 and 24 clearly patentably define over the teachings and fair suggestions found in either Huang, and/or Ohno considered alone or together in any proper combination. Therefore, withdrawal of the

rejection of independent Claims 18 and 24 under 35 U.S.C. §103(a) as being unpatentable over Huang in view of Ohno is respectfully requested for all the reasons set forth above.

In addition the withdrawal of the rejection of dependent Claims 19-21 and 23 over Huang in view of Ohno under 35 U.S.C. §103(a) is respectfully requested as these claims all depend from Claim 18 and, thus, incorporate all the limitations of Claim 18 that are noted above to patentably defines over the teachings and fair suggestions found in Huang, and/or Ohno considered alone or together in any proper combination. Therefore, withdrawal of the rejection of Claims 19-21 and 23 under 35 U.S.C. §103(a) as being unpatentable over Huang in view of Ohno is also respectfully requested.

Also, Claims 19-21 and 23 add features to independent Claim 18 that are further not taught or reasonably suggested by Huang, and/or Ohno considered alone or together in any proper combination. Therefore, withdrawal of the rejection of Claims 19-21 and 23 under 35 U.S.C. §103(a) as being unpatentable over Huang in view of Ohno is respectfully requested for this reason as well.

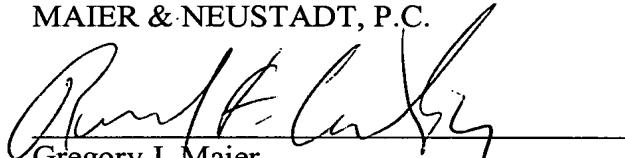
The rejection of Claim 22 under 35 U.S.C. §103(a) as being unpatentable over Huang in view of Ohno in further view of Chang is traversed because Claim 22 depends from Claim 18 and incorporates all its limitations and because Chang cures none of the above-noted deficiencies of Huang, and/or Ohno considered alone or together in any proper combination. Therefore, withdrawal of this rejection of Claim 22 is also respectfully requested. In addition, Claim 22 adds features to those of independent Claim 18 that are not taught or reasonably suggested by any of Huang, Ohno and/or Chang considered alone or together in any proper combination. Therefore, withdrawal of this rejection of Claim 22 is respectfully requested for this reason as well.

Application No. 10/539,806
Reply to Office Action of 03/06/2007

As no other issues are believed to remain outstanding relative to this application, it is believed to be clear that this application is in condition for formal allowance and an early and favorable action to this effect is, therefore, respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Gregory J. Maier
Attorney of Record
Registration No. 25,599

Raymond F. Cardillo, Jr.
Registration No. 40,440

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 06/04)

I:\ATTY\RFC\27\274235-AM.DOC